



REMOTE OPERATION INTO SIGNAL POINT

Caribbean Contesting Consortium



The screenshot displays several software windows. The top-left window, titled '7/2/2018 17:06:05Z General Logging - PJ2_KB7Q_general_logging.s3db', shows a log table with columns for date, call, frequency, mode, sent, and received. The log entries are:

YYYY-MM-DD HH:MM	Call	Freq	Mode	Snt	Rcv
2018-07-02 14:59	K2K	18071.00	CW	599	599
2018-07-02 15:00	I1YRL	18071.00	CW	599	599
2018-07-02 15:01	W1BLT	18071.00	CW	599	599
2018-07-02 15:01	OH6RX	18071.00	CW	599	599
2018-07-02 15:02	HB9JW	18071.00	CW	599	599

The middle-left window, '18071.00 CW Elecraft K3 VFO A', shows a CW control interface with a frequency input field, a 'CQ-Frequency' label, and various function buttons (F1-CQ, F2-EXCH, F3-TU, F4-PJ2KB7Q, F5-HIS, F6, F7?, F8-Agn, F9-sec, F10-NR, F11-spare, F12-VMPE). A 'CW Speed = 26' indicator is visible at the bottom.

The top-right window, 'KPA500 Remote by Elecraft', displays power and status metrics: Power: 476 W, SWR: 1.1 to 1, Current: 12.7 A, Voltage: 53.9 V, Temp: 43 C, and Fan Speed: Auto. A green 'AMP ON' indicator is present.

The bottom-right window, 'KAT500 Remote by Elecraft', shows antenna mode settings: Mode: Manual, Antenna: One, and SWR: 1.18. A green checkmark indicates a successful status.

A small 'Check Master' window at the bottom left shows 'Master 43045'.

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JULY 7, 2018

PJ2T_Remote_Operatio_180707a



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Introduction

Thanks to some superb [Remoterig linking products](#), [Elecraft K3/K3S](#) transceivers, and the Internet operating a ham station remotely has become a reliable and an almost easy exercise. The intent of this document is to provide the resources and guidance for Caribbean Contest Consortium members to successfully connect up to Signal Point and operate remotely with that PJ2/ prefix.

There are two ways to access Signal Point remotely. Mode 4 is for folks just using a computer, some software and a Remoterig RCC-1258 MKII interface box. This is the least expensive way to try remote ops. The description of this mode starts immediately below.

There is also an advanced mode called "K3 Twin Mode" that allows a K3/K3S transceiver or a K3/0 Mini terminal unit at the user's house to become the front panel of the remote K3. Reach out and turn a knob at home, and the corresponding level at the radio changes. This is the Cadillac of remote operating but requires that one own a K3/K3S or K3/0-Min terminal, and uses a bit more bandwidth. A section beginning on page 17 describes this mode.



Mode 4 remote ops - TRX-Manager on top for rig control, and N1MM+ Logger on the bottom - all running on a laptop.

Theory of Operation

Imagine two magic boxes that can create four very, very long serial cables and corresponding virtual com ports that run from your house all the way to Signal Point using the miracle of the Internet. In simplest terms this is what a pair of Remoterig RRC-1258MKII boxes provide.

The Elecraft K3 transceiver at Signal Point has a very reliable serial port connection on the back so you can see where this leads (pun) if we connect rig control software at the user end and talk to the K3 at the far end. Further if we remotely pull pin 8 on the K3's accessory socket to ground we can turn the rig on, and with good CAT software we can turn the rig off, virtually turn any control on the front panel of the radio, and even switch between the K3's two antenna ports all over this very, very long serial cable/port lash-up. How cool is that?!



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The Remoterig RRC-1258 MKII boxes each allocate four serial ports:

COM0 Reserved and used internally for box to box communications, audio transport, PTT, and I/O.

COM1 Available for accessories like amp control etc. TBA

COM2 Nominally used for CAT rig control.

COMExtra Offers WINKEY emulation for CW or RTTY FSK keying.

Our focus will be on using COM2 and COMExtra to get connected. We'll share COM2 between the rig control program and the logging program, and use COMExtra for the virtual WinKeyer on CW.

Our focus right now will be remote operating via a software only solution running on a computer at the user's end. This is called "Mode 4". *No transceiver is required at the user's side, and no computer is needed or desired at the radio side of things.*

These set up procedures may seem a bit elaborate, but remember this is a one-shot effort. Once you have it working you just connect and play ham radio.

Requirements for the User End

A decent Internet connection, basic DSL or better

[User side Remoterig RRC-1258 MKII box](#), and a few cables, Wi-Fi module optional

A decent computer, WIN7 or better

Serial to USB converter (FTDI chipset)

Rig control software. [TRX-Manager](#) is strongly recommended.

A Logging Program. [N1MM+ Logger](#) works well, and is free.

Configure the Remoterig RRC-1258 MKII

Use the Remoterig [manual](#) (page 21 and then page 222) to open the box and install the red jumper wires for a K3 radio, and check the push on jumpers also. You're only configuring the user side box. The rig side box has already been done by the remote operating trolls who live in the cave under Signal Point.

Connect the Remoterig box to your network. The basic way is to run an Ethernet cable to a RJ-45 jack on the back of your home modem/router from your computer's Ethernet port. A Wi-Fi module is an RCC box option and eliminates the cable.

The first part of the [Remoterig manual](#) (page 27) on how to get the box up and running on your local area network (LAN) is very good. The manual is excellent, and you'll find it quite helpful. Follow those directions until you can type the IP address of the Remoterig RRC-1258 MKII box into a web browser and have its configuration web page appear. For example: Here at my house, on my network, I use IP address 192.168.0.227.

In most cases your network will use either the 192.168.0.XXX or 192.168.1.XXX set of addresses. The default address for the Remoterig box is 192.168.0.227, so you may luck out if your network uses the 192.168.0.XXX configuration.

If you can access the Remoterig box's configuration web page do the "[Happy Feet Dance](#)" as this is a major first step toward remote operations.

Next you'll configure the box following these screen shots of the box's web pages to configure each of the sub-menus.

N.B. When you change a parameter you must hit the SUBMIT button each time, and at the end of the session to make all the changes permanent press **APPLY CHANGES**. Otherwise you get to perform a "do over". Then you hit **APPLY CHANGES** the Remoterig box will re-boot and come back to life.



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Here are the screen shots you need for the user side configuration mode 4:

The screenshot shows the 'microbit' web interface. On the left is a navigation menu with options like 'Info', 'Status', 'Wi-Fi scan', 'Profiles', 'IP settings', 'Radio settings', 'Serial settings', 'Advanced settings', 'Dynamic DNS settings', 'Keyer settings', 'IO settings', 'Ping settings', 'Wi-Fi settings', 'Export settings(HTML)', 'Export settings(bin)', 'Import settings(bin)', 'Application upgrade', 'Bootloader upgrade', and 'Restart device'. The main area is titled 'IP settings' and contains the following fields:

Unit ID (Banner)	<input type="text" value="KB7Q Remote Operator Side"/>
DHCP	<input type="text" value="No"/>
IP	<input type="text" value="192.168.0.227"/>
Netmask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.0.1"/>
Dns server	<input type="text" value="192.168.0.1"/>
Eth-type	<input type="text" value="Auto, prefer 10 Mbit"/>
IP-interface	<input type="text" value="Auto, prefer Ethernet"/>
Web page user	<input type="text"/>
Web page pwd	<input type="text"/> <input type="button" value="Show"/>
Web page user(saving)	<input type="text"/>
Web page pwd(saving)	<input type="text"/> <input type="button" value="Show"/>

At the bottom of the IP settings section is a button.

These IP settings setting will be unique to your LAN. The manual provides guidance.

Radio settings

The screenshot shows the 'Radio settings' configuration page with the following fields:

Program mode	<input type="text" value="4 - Yaesu, Kenwood, Elecraft"/>
Sip password	<input type="text" value="Hello"/> <input type="button" value="Hide"/>
Sip contact(Radio RRC IP/hostname)	<input type="text" value="vjxe2ic0.ddns.remoterig.com"/>
Auto connect	<input type="text" value="No"/>
Audio quality	<input type="text" value="2 - Linear 16 bits 8 kHz"/>
Audio left/right ch swap	<input type="text" value="No"/>
Codec out gain	<input type="text" value="255"/>
Codec inp gain	<input type="text" value="18"/>
Codec inp HPF Hz	<input type="text" value="163"/>
Codec inp preamp	<input type="text" value="Yes"/>
COM0 baudrate	<input type="text" value="9600"/>
COM0 data bits	<input type="text" value="8"/>
COM0 stop bits	<input type="text" value="1"/>
COM0 parity	<input type="text" value="0 - Off"/>
COM0 Program mode 3 char timeout	<input type="text" value="2"/>
Use USB Com Port as COM0	<input type="text" value="No"/>

At the bottom of the Radio settings section is a button.

Radio Settings sub menu, these are the same setting for all users. That's a zero in the SIP contact address.



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The screenshot shows the Microbit web interface with the 'Serial settings' tab selected. The left sidebar contains a navigation menu with options like 'Info', 'Status', 'Wi-Fi scan', 'Profiles', 'IP settings', 'Radio settings', 'Serial settings', 'Advanced settings', 'Dynamic DNS settings', 'Keyer settings', 'IO settings', 'Ping settings', 'Wi-Fi settings', 'Export settings(HTML)', 'Export settings(bin)', 'Import settings(bin)', 'Application upgrade', 'Bootloader upgrade', and 'Restart device'. The main content area is titled 'Serial settings' and contains three sections: COM1 mode (Inactive), COM2 mode (Mode-4, Kenwood, Yaesu, Elecraft), and COM3(Extra) mode (Mode-6, Winkeyer). Each section has fields for baudrate, data bits, stop bits, parity, rts/cts, and terminator (hex), along with a checkbox for 'Use USB Com Port as COMX'. A 'Submit' button is at the bottom.

We're going to use just one serial port for now. We'll share it between rig control and logging programs.

The screenshot shows the Microbit web interface with the 'Advanced settings' tab selected. The left sidebar is identical to the previous screenshot. The main content area is titled 'Advanced settings' and contains various network and audio parameters: UDP cmd port (13002), UDP audio port (13001), SIP port (13000), Web server port (80), Telnet server port (23), Rx jitter buffer size (13), Rx jitter delay (12), Audio packet size (ms) (20), RTP tx mode (Normal), Disable audio tones (Yes), Audio tones -db [70-0] (30), IP identification (morse) (No), Full duplex (No), PTT-off mute delay (0), IP Type-of-Service (dec) (0), UDP cmd min-data-size (0), and Use common network settings (No). A 'Submit' button is at the bottom.

Note RX jitter buffer and delay parameters. These get adjusted as needed to eliminate audio drop outs.



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Keyer settings

Enable	<input type="text" value="Yes"/>
Iambic	<input type="text" value="Mode-A"/>
Paddle reverse	<input type="text" value="No"/>
Weight [25-40]	<input type="text" value="30"/>
Side tone hz [0,300-1500]	<input type="text" value="500"/>
Side tone -db [50-0]	<input type="text" value="50"/>
Lf delay ms [0-500]	<input type="text" value="100"/>
Key delay ms [0-250]	<input type="text" value="100"/>
Speed pot min wpm [5-99]	<input type="text" value="10"/>
Speed pot max wpm [5-99]	<input type="text" value="40"/>

Keyer settings for CW. Key delay gets adjusted for best sounding CW.

The screenshot shows the microbit web interface. On the left is a navigation menu with the following items: Info, Status, Wi-Fi scan, Profiles, IP settings, Radio settings, Serial settings, Advanced settings, Dynamic DNS settings, Keyer settings, IO settings, Ping settings, Wi-Fi settings, Export settings(HTML), Export settings(bin), Import settings(bin), Application upgrade, Bootloader upgrade, and Restart device. The main content area is titled "IO settings" and contains the following configuration options:

IN0 mode	<input type="text" value="I/O"/>
OUT0 mode	<input type="text" value="Connect"/>
OUT1 mode	<input type="text" value="I/O"/>
OUT2 mode	<input type="text" value="I/O"/>
USB RTS as PTT	<input type="text" value="Disabled"/>
USB DTR as CW	<input type="text" value="Disabled"/>

Below the settings is a button.

I/O settings, same for all.



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The Remoterig box is now configured. Normally you would go to the status sub menu and click on the CONNECT button when you want to start a remote operating session. If you've networked things correctly, and configured the Remoterig box correctly it will connect. Plugging headphones into the SP jack on the front of the Remoterig box will even give you rig audio. But we have a problem - read on.



This is nominally how we start a remote session, but we're not ready for that yet.

We have no way to issue a software command to turn the rig off right now. Elecraft K3/K3S transceivers have no provision to be shut down via hardware. A software command must be issued. So even if you hit the disconnect button the Internet link will drop, but the rig will hang in a semi-off state with the front panel lighted - not the best situation. Rig control hardware and software to the rescue!

Rig Control - Hardware first

Your computer needs to talk to serial COM2 on the back of the Remoterig RRC-1258 MKII box. Most computers these days only have USB ports, so we'll use a Serial to USB port adapter here. I really like the Elecraft KUSB unit as it uses the FTDI chip set and is totally reliable. Avoid any adapter that uses the Prolific chip set.

Now comes a bit of computer confusion. Remoterig calls the serial port on the back of the RRC-1258 MKII unit COM2, but for sure when you plug the serial to USB cable into your computer it will get assigned to whatever com number Windows OS likes. COM2 is probably already in use. So how to discern the proper com port number for use with setting up the rig control software?



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Before you plug the serial to USB converter in go to a program called "Device Manager" i.e. Start Menu --> Control Panel ---> Device Manager and expand the ports list. Now plug the Serial/USB unit into an available USB port on the computer and you'll see it appear in the ports list after it gets installed and you'll be able to write down the correct com port number associated with it. This will be what is used to connect the rig control software. The first time you plug the Serial to USB adapter cable in it can take a few minutes to install.

Going forward always plug the Serial to USB adapter into the same USB port on your computer - this keeps from creating more and more and more virtual serial ports.



Remoterig box with Serial to USB cable attached to com2 on the back. The optional Wi-Fi module is installed.

Rig Control - Software

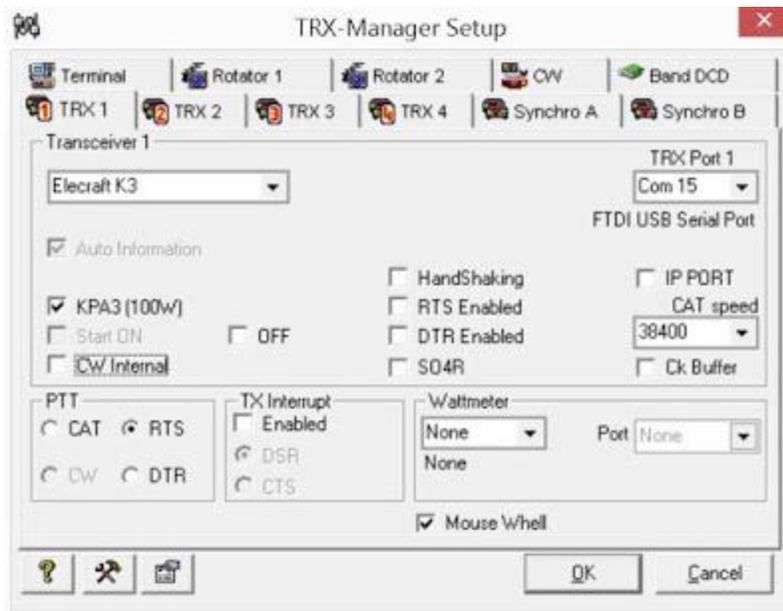
Down load and install a rig control software package. I recommend TRX-Manager or WIN4K3Suite, as both allow us to share a single serial port between itself and another program like a logging app. [TRX-Manager](#) is the clear winner in my book, so TRX-Manager will be used in these examples. We know now what com port to connect to from our sleuthing with Device Manager. In this example we'll use COM15.



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Go to TRX-Manager --> Parameters --> TRX1 Tab and config as below. Your com port will be different.



TRX-Manager -> Parameters -> Setup -> TRX1 Tab.

Close TRX-Manager.

Now you can play some and enjoy the next level of success. To connect to Signal Point first bring up the Remoterig web page in your browser and in the status sub-menu click on the connect button. If you have headphones plugged into the "SP" jack on the front of the Remoterig box you should hear the rig click on and get an audio stream. Next fire up TRX-Manager and see if the virtual VFO reads correctly and that you can adjust the controls and have the radio respond. Use your mouse's right/left buttons to turn the virtual VFO knob. Make sure both "Monitor" and "Levels" windows are open from the "Transceiver" menu in TRX-Manager.

N.B. You must establish the connection to Signal Point first BEFORE you start TRX-Manager. Otherwise there is no serial port for TRX-Manager to use - it will complain.

To end the session you hit the virtual power button in TRX-Manager "Levels" window to shut the rig off, then hit the disconnect button over in the Remoterig box's status sub-menu web page.

We're at a major break-thru point now. I suggest you play around and get your sea-legs using TRX-Manager before we tackle logging software and CW Keying.

A thought - For practice I recommend you connect the Serial/USB adapter to your home radio and play with TRX-Manager that way also. TRX-Manager supports most all popular rigs, not just K3 transceivers.

Installing N1MM+ Logger

The logging program connects to the radio through TRX-Manager, it does NOT have a direct connection. This is fine as it saves a serial port for other uses and N1MM+ is just reading frequency



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and mode for logging purposes – it is a low impact task that can piggy-back onto TRX-Manager.

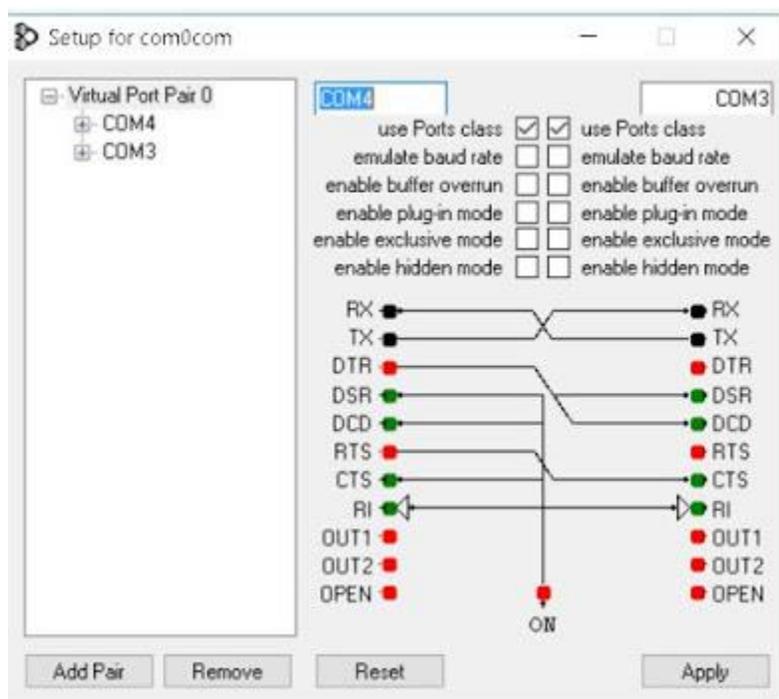
To this end we need to create a linked virtual serial port pair that resides internally on your computer. TRX-Manager will use one port and N1MM+ the other to chat back and forth.

We need a program called COM0COM. Here is the web [link](#).

For a 64 bit computer download and install the program listed as com0com-2.2.2.0-x64-fre-sgnd.zip

A 32 bit computer uses com0com2.2.2.0-i386-fre.zip

Run com0com by going to the Start menu on your computer --> com0com folder -->setup. A virtual com port pair will have been created for you already but it will have two weird names. Just click on each name and rename them to be two com port numbers NOT being used by your computer. You can use control panel --> Device Manager again if need be to review your COM port assignments.



com0com screen shot. Com ports renamed COM3 and COM4 in this example. Apply and exit.

You're done with com0com.

Ok, now we teach TRX-Manager and N1MM+ Logger how to communicate using this newly created port pair. Run TRX-Manager and select Parameters --> Setup --> SyncroA tab and configure per the image below. Your COM number will probably be different. It is one of the two ports you just created.



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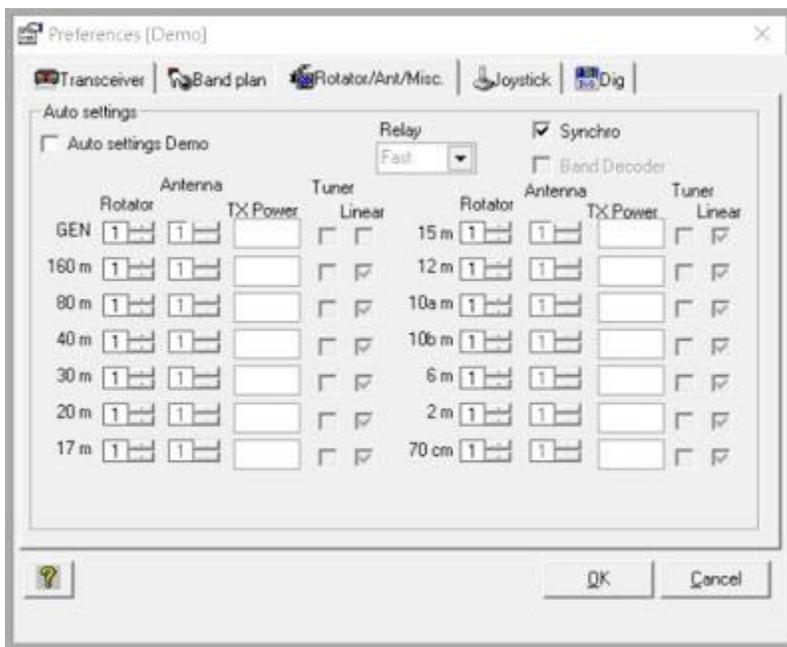
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TRX Manager --> Parameters --> Setuo --> SyncroA tab

Yes, strange that we're using a "Kenwood" setting while the radio is an Elecraft K3. Remember we're not talking to the K3 directly, so we're using a vanilla communication format called "Kenwood" to communicate with TRX-Manager.

Now go to TRX-Manager --> Parameters --> Preferences --> Transceiver/Rotor --> Rotor/Ant/Misc tab and click on the Syncro check box. Click OK. Quit TRX-Manager for now.



TRX Manager --> Preferences --> Transceiver/Rotor --> Rotor/Ant/Misc tab



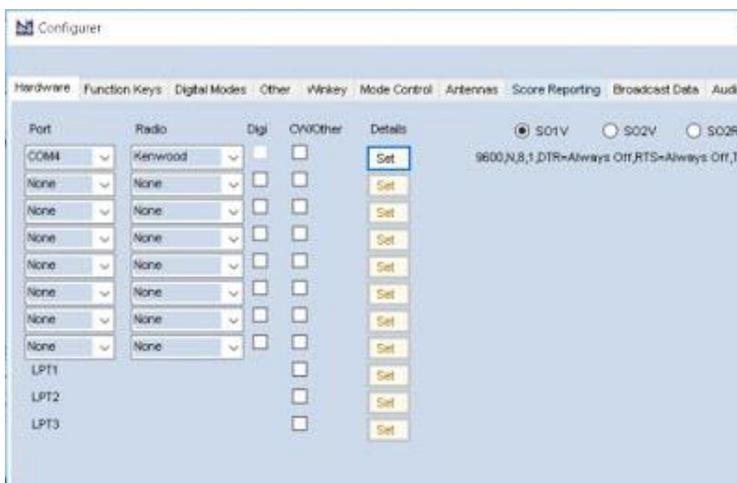
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TRX-Manager now knows how to chat it up with N1MM+ Logger.

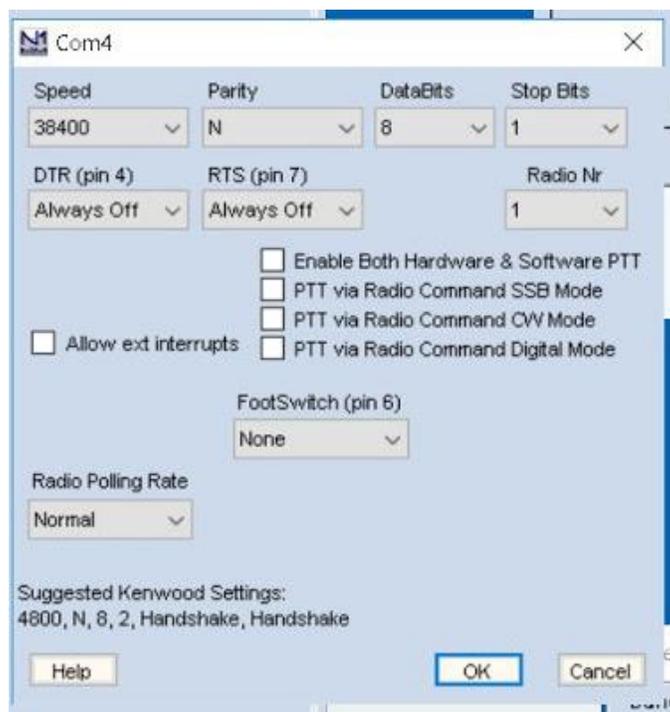
Let's train N1MM+ to chat back. If you need a copy of N1MM+ Logger get it [here](#). Start N1MM+ Logger and configure the other matching virtual com port assigning it to a generic Kenwood radio.

N1MM+ --> Config --> Configure Ports, Mode Control, Audio, Other ...

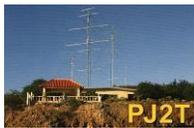


N1MM+ is actually sending info to TRX-Manager thru this fake Kenwood radio.

Click on "SET" and complete the process as shown below. Then click OK and exit N1MM+ logger for now.



38400 bps, N parity, 8 data bits, 1 stop bit.



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Success?

You should be able to connect to Signal Point via the connect button on your Remoterig box's web status sub-menu page first, then start TRX-Manager, and finally run N1MM+ and see the correct frequency at the top of the band map if everything is linked up correctly.

TRX-Manager must NOT be minimized to work correctly.

You must always start the operating session in the sequence of 1) establish the link by hitting the connect button in your Remoterig box 2) start TRX-Manager, 3) start N1MM+ Logger. To end a session you do the reverse, hitting the virtual power button in TRX-Manager as you go.

Next - getting CW working with the virtual WinKeyer

N1MM+ will access the virtual WinKeyer via the mini USB/USB cable that came with the Remoterig box. We need to install yet some more virtual ports, one of which we use for the WinKeyer.

Before you plug the cable into the front of the Remoterig RRC-1258 MKII box and run it over to another USB port on your computer download, install, and run the utility program " Microbit Setup Manager" found [here](#).

You may have very well run this program already when you first were setting up the Remoterig box for your home network. If you did good on you, as it installed the virtual ports needed automatically behind the scenes.

Plug in both cable ends. Wait for the drivers to install if this a first time run. It can take several minutes. Once again back to the Device manager and see what port number is now assigned to COMExtra. This is the port the WinKeyer will use. Exit Device Manager.



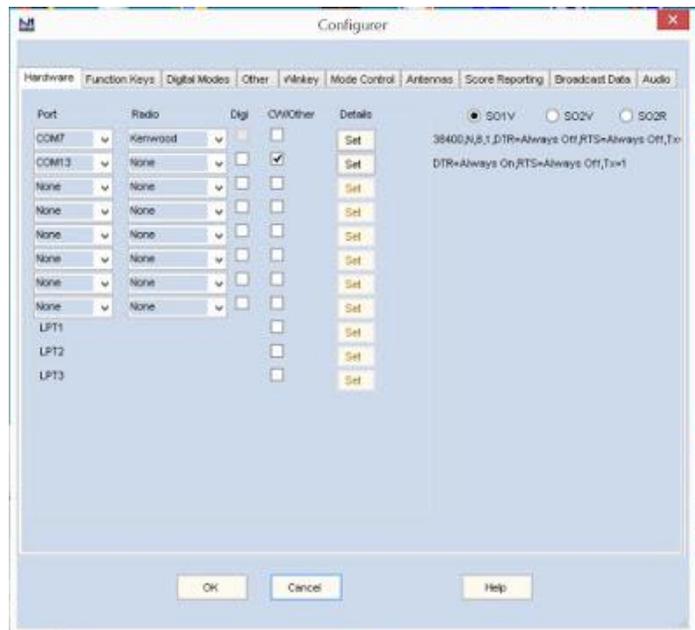
A Device Manager example.



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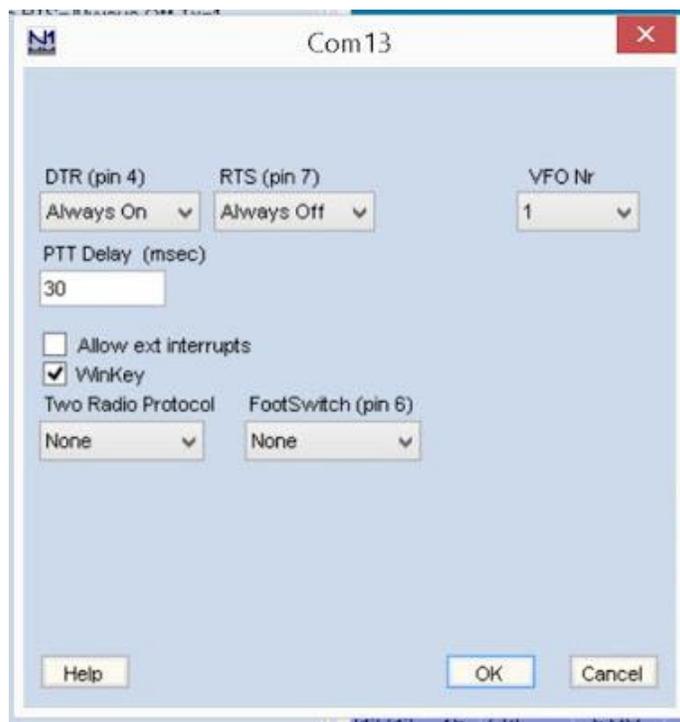
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Now let's tell N1MM+ Logger about the WinKeyer. Go N1MM --> Config --> Configure Ports, Mode Control, Audio, Other ... and add the serial port the WinKeyer is on and click the CW/Other box. In this case the WinKeyer is on COM13.



WinKeyer in this example is on COM13. Click CW/Other box.

Now select set, and configure like this:



Easy huh?



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You can go over to the WinKeyer tab, but the default settings there work fine for now, as we're setting keying lead and tail times in the Remoterig boxes. Done.

You now should be able to use both the paddle attached to the Remoterig box's back panel "PAD" and the function key messages you set up in N1MM+ Logger. I'd use a CW speed of 30 wpm or less given the latency into Signal Point.

Operating SSB

You should be able to plug a microphone into the front panel RJ-45 socket of the Remoterig box and use TRX-Manager to set the mic gain on the K3. Use PTT as VOX works poorly or not at all over the link.



For SSB I use a Kenwood MC-43S microphone with an adapter plugged into the front of the RCC box.

Bonus

If you go to the External menu in TRX-Manager you can even have the K3's virtual front panel rendered quite realistically. Yes, the knobs turn and are functional. Use your left/right mouse buttons!



Talk about virtual reality.



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Operating Notes

The reliability of remote operating mostly depends on the quality of the Internet connect between you and the rig. Typical ping times from Montana to Signal Point and back for example are around 155ms, which is not fantastic, but certainly a fair to good link. These times are also referred to as the latency of the connection.

If the circuit degrades much beyond 200ms your CW keying will start to fall apart and the virtual rig controls will become sluggish. Received audio will start to have drop outs - a unique experience on CW.

Often I watch the [RBN web site](#) --> DX Spots --> spot search with my own call (PJ2/KB7Q) entered to see how my CQ'ing is being decoded by the skimmers.

You can test the circuit yourself by connecting and looking in the Remoterig Status sub-menu for the "Other Party" IP address. From a command prompt on your computer you can issues a ping command to this address. Example: PING 190.88.150.80 I often do this as I start an operating session to see the current quality of the Internet connection.

```
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\WINDOWS\System32>ping 190.88.150.80

Pinging 190.88.150.80 with 32 bytes of data:
Reply from 190.88.150.80: bytes=32 time=157ms TTL=53
Reply from 190.88.150.80: bytes=32 time=155ms TTL=53
Reply from 190.88.150.80: bytes=32 time=155ms TTL=53
Reply from 190.88.150.80: bytes=32 time=157ms TTL=53

Ping statistics for 190.88.150.80:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 155ms, Maximum = 157ms, Average = 156ms

C:\WINDOWS\System32>
```

Very typical ping times for the circuit to Curacao.

N.B. If you see ping times >500ms it means the Signal Point webcams are on. You might want to email the control operator requesting they be shut down.

Operating remotely with manual tune amplifier is a dicey game at this point, we can't see SWR or grid current remotely. You can see the K3's power output to make sure you're not over driving the amp.

We have to rely on the control operator to set the amp up for us. Going forward there are solutions (KPA500 for example), but right now we're on thin ice using an amp. Success requires close coordination and confirmation with the control operator before you start transmitting.



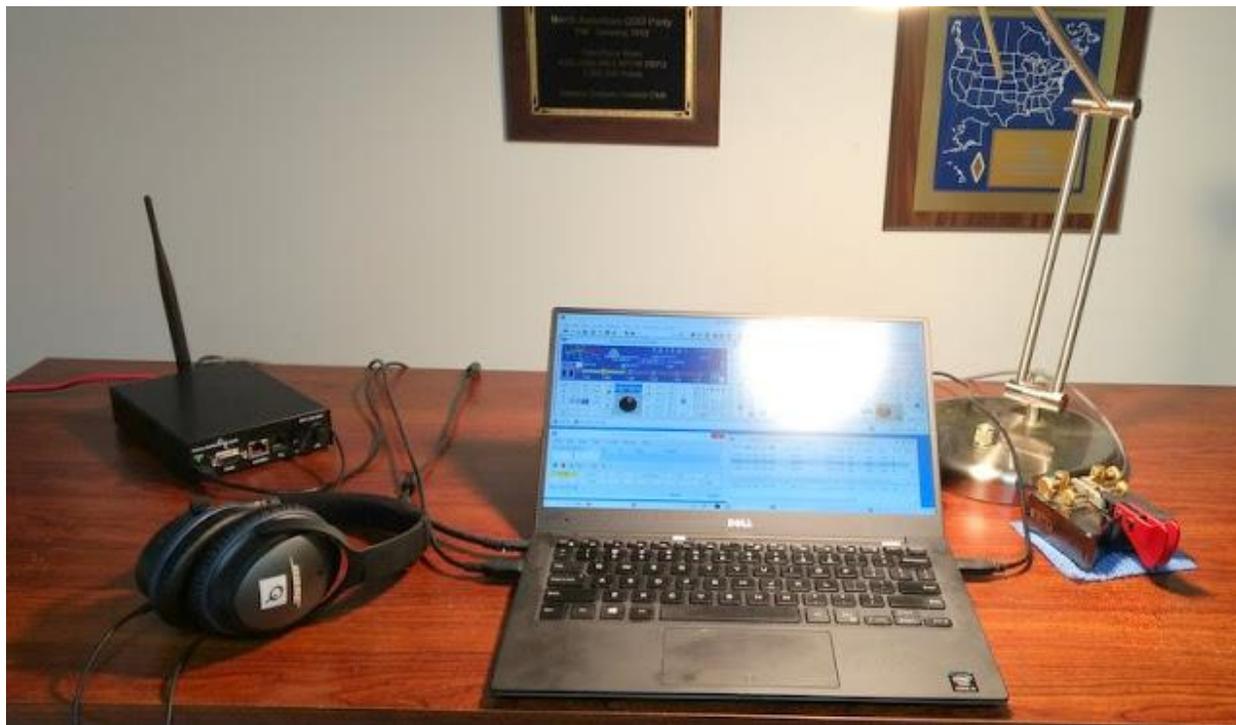
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I would suggest sticking to low power operating for now. TRX-Manager will show you the SWR the K3 is seeing into the antenna if you hit the TUNE button and wait a few seconds.

A control operator must be present at Signal Point. To keep this person in the loop you usually have to check in with him via email to have him power up the remote radio and gear.



Just a boy, his computer, and a Remoterig box. Island shirt and sandals optional. :-)

K3 to K3 Twin mode configuration begins on the following page.



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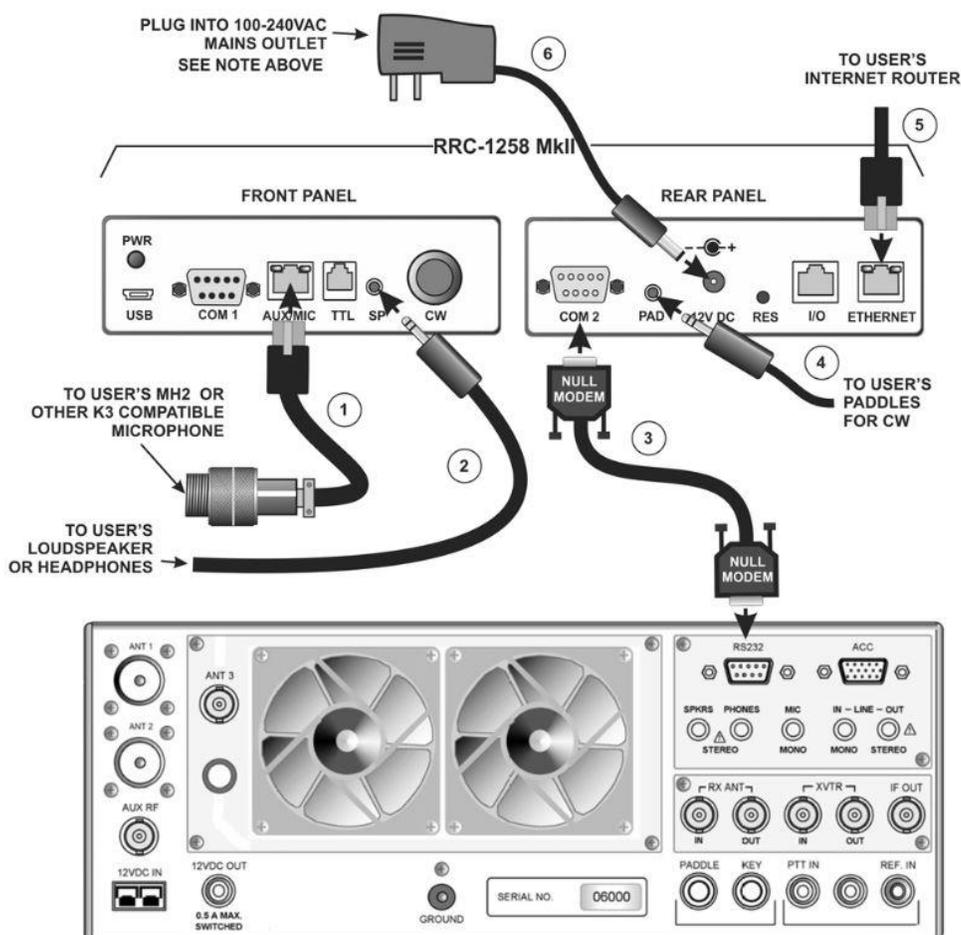
Advanced Connection - K3 Twin Mode

If you own an [Elecraft K3/K3S transceiver](#) or a [K3/0 Mini](#) you can configure the remote operation so that you use your radio as the front panel of the transceiver at Signal Point. Turn a knob on your home rig and the corresponding change happens on the Curacao side K3 radio. Even the power button works for both ON and OFF. K3 twin mode is the ne-plus-ultra of remote operating and highly recommended!

The hardware connection for K3 Twin mode with a K3/K3S transceiver requires a male/male [NULL MODEM cable](#) be connected from COM2 on the back of the user's RCC 1258 MKII box to the RS232 port on the rear of their K3/K3S. If you have a K3/0 Mini terminal unit the all-in-one octopus cable takes care of this for you.

COM1 on the front of the RCC 1258 MKII box will be for a your logging program (N1MM+) using a serial to USB adapter cable to get to a USB port on your computer. Use Device Manager to discern which com port number your computer assigns to Remoterig's COM1.

A cable from the RRC box's front panel min-USB port to another USB port on your computer will provide a virtual WinKeyer for CW. This is the COMExtra port, again use Device Manager to figure out what com port number it is assigned to.

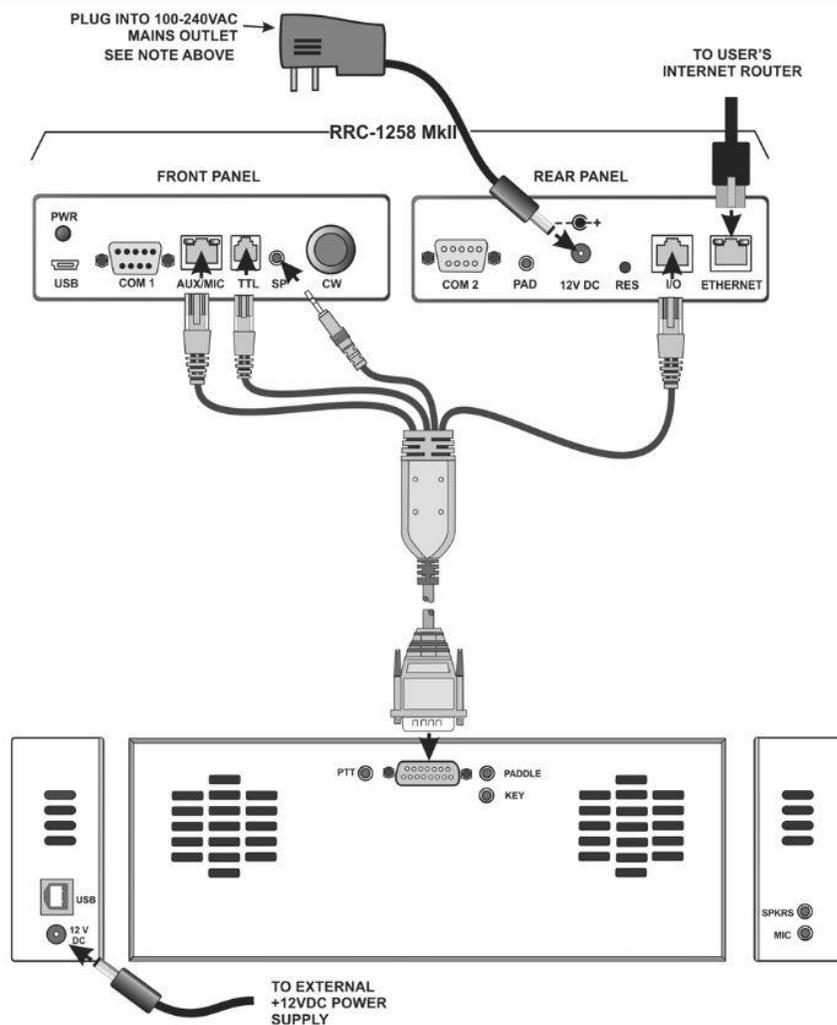


K3 to K3 hookup for the operator's side of things.



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K3/0 Mini hookup. The optional all-in-one RRMNICBL cable is highly recommended.



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Your RRC box needs to be configured as follows for K3 Twin Mode:

IP settings

Unit ID (Banner)	<input type="text" value="KB7Q Remote Operator Side"/>
DHCP	<input type="text" value="No"/>
IP	<input type="text" value="192.168.1.227"/>
Netmask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.1.1"/>
Dns server	<input type="text" value="192.168.1.1"/>
Eth-type	<input type="text" value="Auto, prefer 10 Mbit"/>
IP-interface	<input type="text" value="Auto, prefer Ethernet"/>
Web page user	<input type="text"/>
Web page pwd	<input type="text"/> <input type="button" value="Show"/>
Web page user(saving)	<input type="text"/>
Web page pwd(saving)	<input type="text"/> <input type="button" value="Show"/>

Radio settings

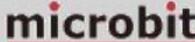
Program mode	<input type="text" value="14 - Elecraft K3 twin"/>
Sip password	<input type="text" value="Hello"/> <input type="button" value="Hide"/>
Sip contact(Radio RRC IP/hostname)	<input type="text" value="vjxe2ic0.ddns.remoterig.com"/>
Auto connect	<input type="text" value="No"/>
Audio quality	<input type="text" value="2 - Linear 16 bits 8 kHz"/>
Audio left/right ch swap	<input type="text" value="No"/>
Codec out gain	<input type="text" value="255"/>
Codec inp gain	<input type="text" value="18"/>
Codec inp HPF Hz	<input type="text" value="163"/>
Codec inp preamp	<input type="text" value="Yes"/>
COM0 baudrate	<input type="text" value="38400"/>
COM0 data bits	<input type="text" value="8"/>
COM0 stop bits	<input type="text" value="1"/>
COM0 parity	<input type="text" value="0 - Off"/>
COM0 Program mode 3 char timeout	<input type="text" value="2"/>
Use USB Com Port as COM0	<input type="text" value="No"/>



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RRC-1258 MkII: Control [KB7Q Remote Operator Side]



Info
Status
Wi-Fi scan

Profiles

IP settings
Radio settings
Serial settings
Advanced settings
Dynamic DNS settings
Keyer settings
IO settings
Ping settings
Wi-Fi settings

Export settings(HTML)
Export settings(bin)
Import settings(bin)

Application upgrade
Bootloader upgrade

Restart device

Serial settings

COM1 mode	Mode-7, CAT to COM2 (remote) ▾
COM1 baudrate	38400 ▾
COM1 data bits	8 ▾
COM1 stop bits	1 ▾
COM1 parity	0 - Off ▾
COM1 rts/cts	No ▾
COM1 terminator (hex)	00
Use USB Com Port as COM1	No ▾
COM2 mode	Logical parallel with COM0 ▾
COM2 baudrate	38400 ▾
COM2 data bits	8 ▾
COM2 stop bits	1 ▾
COM2 parity	0 - Off ▾
COM2 terminator (hex)	00
Use USB Com Port as COM2	No ▾
COM3(Extra) mode (USB-COMFSK)	Mode-8, WinKeyer ▾

Submit

Apply changes

Serial settings now uses both com ports at 38400 bps.



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RRC-1258 MkII: Control [KB7Q Remote Operator Side]

microbit

Info
Status
Wi-Fi scan

Profiles

IP settings
Radio settings
Serial settings
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Dynamic DNS settings
Keyer settings
IO settings
Ping settings
Wi-Fi settings

Export settings(HTML)
Export settings(bin)
Import settings(bin)

Application upgrade
Bootloader upgrade

Restart device

Advanced settings

UDP cmd port	<input type="text" value="13002"/>
UDP audio port	<input type="text" value="13001"/>
SIP port	<input type="text" value="13000"/>
Web server port	<input type="text" value="80"/>
Telnet server port	<input type="text" value="23"/>
Rx jitter buffer size	<input type="text" value="12"/>
Rx jitter delay	<input type="text" value="11"/>
Audio packet size (ms)	<input type="text" value="20"/>
RTP tx mode	<input type="text" value="Normal"/>
Disable audio tones	<input type="text" value="Yes"/>
Audio tones -db [70-0]	<input type="text" value="30"/>
IP identification (morse)	<input type="text" value="No"/>
Full duplex	<input type="text" value="No"/>
PTT-off mute delay	<input type="text" value="0"/>
IP Type-of-Service (dec)	<input type="text" value="0"/>
UDP cmd min-data-size	<input type="text" value="5"/>
Use common network settings	<input type="text" value="No"/>

RRC-1258 MkII: Control [KB7Q Remote Operator Side]

microbit

Info
Status
Wi-Fi scan

Profiles

IP settings
Radio settings
Serial settings
Advanced settings
Dynamic DNS settings
Keyer settings
IO settings
Ping settings
Wi-Fi settings

Export settings(HTML)
Export settings(bin)
Import settings(bin)

Application upgrade
Bootloader upgrade

Restart device

Keyer settings

Enable	<input type="text" value="Yes"/>
Iambic	<input type="text" value="Mode-A"/>
Paddle reverse	<input type="text" value="No"/>
Weight [25-40]	<input type="text" value="30"/>
Side tone hz [0,300-1500]	<input type="text" value="500"/>
Side tone -db [50-0]	<input type="text" value="50"/>
Lf delay ms [0-500]	<input type="text" value="175"/>
Key delay ms [0-250]	<input type="text" value="175"/>
Speed pot min wpm [5-99]	<input type="text" value="10"/>
Speed pot max wpm [5-99]	<input type="text" value="40"/>



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RRC-1258 MkII: Control [KB7Q Remote Operator Side]

The screenshot shows the Microbit web interface. On the left is a navigation menu with the Microbit logo and various settings categories. The main area displays the 'IO settings' page with several dropdown menus and a 'Submit' button.

IO settings	
IN0 mode	I/O
OUT0 mode	Connect
OUT1 mode	I/O
OUT2 mode	Keyer
USB RTS as PTT	Disabled
USB DTR as CW	Disabled

Submit

When set up correctly simply turning your local K3 or K3/0 mini on will automatically connect you to the Signal Point K3 transceiver. All controls on the face of your rig now control the remote K3. While connected any menu settings you change effect the remote Signal Point radio, NOT your rig.

You can connect a contest logging program like N1MM+ Logger to Com1 on the front of your RRC box using a serial/USB adaptor cable so that frequency and mode are passed between the two. Use whichever com port # Windows assigns to your adaptor set to 38400 bps 8N1. Use Device Manager control panel to discern the proper port number.

For CW keying use the mini-USB port on the front of the RRC box with the supplies cable to connect to another USB port on your computer. The RRC box supplies a virtual WinKeyer via ComExtra. Set N1MM+ logger up as if using a WinKeyer to this com port. Again, Device Manager will tell you then correct port number to use.



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Elecraft KPA500 Amplifier - Remote Care and Feeding

A big thanks to Jeff, K8ND for donating the use of his Elecraft KPA500/KAT500 amplifier/tuner package for the remote station. Here's what you need to know to be able to run remotely at 500 watts and attract a larger pileup!

We use the amplifier and tuner together, in fact even when running barefoot you should bring up and use the remote tuner to monitor and correct SWR and select the correct antenna.

Always test the antenna's SWR before bringing the KPA500 amp online, use the K3's "tune button" which will apply a low-level drive signal. **Have high SWR? Refer to the tuner operation on page 25.** Only when you have SWR 1.5:1 or less place the amp on-line and check drive power on the K3 by turning the power knob a bit left or right to get a reading. 20 watts drive will give you about 450 watts, and that should be the default setting you see.

Remote Amplifier Setup

First download and install a copy of TeamViewer remote software so you can access the computer at position #4 at Signal Point and run the KPA500 Remote management software. Here's the link:
www.teamviewer.us/Download/Free

Use TeamViewer to access the remote computer desktop.

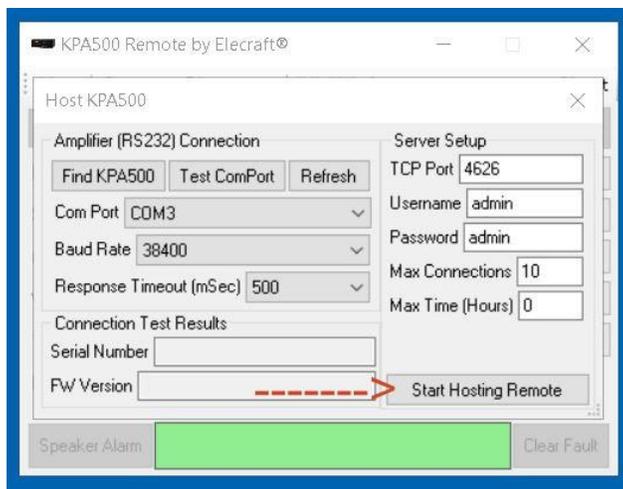
Partner ID: 445 589 478

Password: ElecraftK3 (note the two capital letters)

The remote computer's desktop will appear on your computer's screen, in the upper right you'll see the KPA500 Remote icon. Double click on it to run.



Once the software starts click on the "Host" tab. Then click on "Start Hosting Remote".





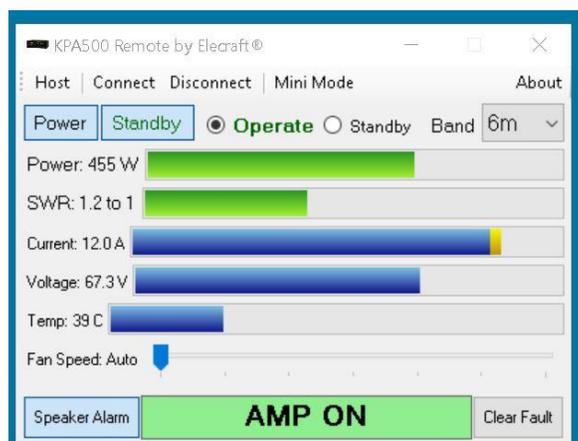
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In 3 to 5 seconds the amplifier will turn on in standby mode. A very complete amplifier control panel will appear. You can control and monitor all the operating parameters of the amp. **As the amp is still in standby - this is your final chance to check the SWR safely if you forgot. If you have SWR above 1.5:1 refer to the tuner section of this manual on page 25. We have an app and a QRO tuner for that!**

Use the KPA500 Remote software to put the amplifier into operate mode. Check the drive level by turning the knob slightly on the K3 exciter either way. The amp needs to be in operate mode to check the actual drive power. 20 watts is the drive power default. Never exceed 500 watts output. Monitor SWR, power out, and temperature as you operate.



Shutting Down

When you are finished let the amp cool for several minutes, then shut the amp off, close the KPA500 Remote software, and quit TeamViewer so the next operator can access the amp.

Important things to know about this jewel of an amp

The K3 is set that if the amp is off or in standby the K3 transceiver will default to 100 watts out for barefoot operation. When the amp is placed in operate mode the drive power drops back to 20 watts automatically. That is why the amp needs to be placed in operate to check the drive level – *you'll only see the correct driving power when in operate mode.*

The amp is smart, and will protect itself. If you mildly exceed SWR or drive power limits it will momentarily insert a 3 db pad into its input circuit to reduce the/ output power. If you persist or grossly exceed operating parameters, the amplifier will do a hard fault and take itself offline i.e. go into standby mode. The amp is also a tattletale, it writes any faults into a time stamped file for review.

Before you try and bring the amp back online fix the problem, and/or consult with the control operator for help. To recover from a hard fault simply place the amplifier back into operate mode.

You can manually set a higher fan speed for contesting or high duty cycle modes. The highest speed will surely annoy the control operator.

Page 26 has a brief check list you can use for reference.

Please do not exceed 25 watts drive or 500 watts out or an SWR greater than 1.5:1.



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KAT500 QRO Antenna Tuner

If you have an SWR above 1.5:1 use the remote Elecraft KAT500 antenna tuner so the KPA500 amplifier will be happy and not fault offline when you try to operate. Note: The KPA500 amplifier is still in standby during the following procedure.

On the remote desktop you'll see an icon for the KAT500 tuner in the upper right corner. Double click to start the app. It takes several seconds for the app to start. Click on the host tab, then click "Start Hosting Remote".



Make sure the tuner is in Manual mode, and the proper antenna is selected. The power button should be blue indication the tuner is in fact powered up. Use the buttons on the left if needed to make changes.

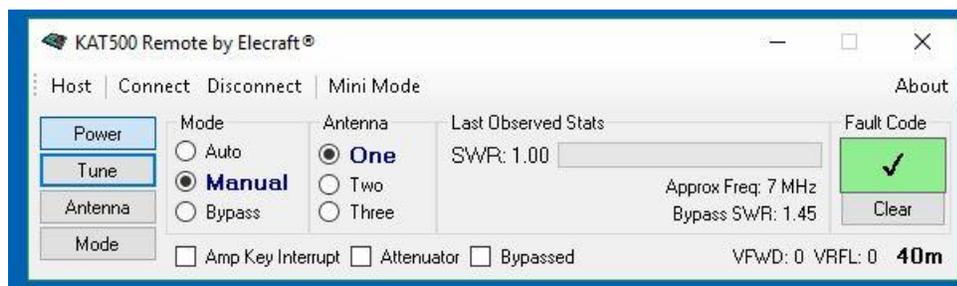
Click on the "Tune" button, it will turn blue.

Send some RF to the tuner from the K3 transceiver by pressing and holding the "TUNE" button on the K3 for a few seconds – yes, you are pressing a second "tune" button, this one on the radio. The K3 will apply 20 watts of RF.

Wait several seconds while the tuner tries various L/C combinations and selects the lowest SWR. The tuner's tune button will go from blue back to clear when the tuning is complete. You can read the resultant SWR in the app.

Quick press the tune button of the K3 to stop transmitting RF.

You may now bring the amplifier online and operate QRO.



Tuner Notes

On some bands like 40M and 17M we only have access to one antenna, so the tuner has probably already been "trained", and the lowest SWR will have be selected automatically – but check. Other bands have multiple antenna choices and you may very well have to use the tuner to get best SWR, especially on the SSB band segments. If the native SWR of the antenna is < 1.3:1 the tuner will just use "bypass" when you request a tune. This save wear and tear on the tuner's relays.

Manual mode is the default, and preferred. Going forward we'll use the KAT500 tuner and not the K3 for ANT1/ANT2 selection, even barefoot.



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Signal Point QRO Remote Operating Check List

Going On Procedure

- 1) Slack – state intention to operate the remote and get antenna info that control op has posted
- 2) User's RRC box on – correct profile selected, computer on
- 3) Establish remote connection with K3/0 Mini. Place radio on proper band.
- 4) Start TeamViewer, access remote computer. Login: 445 589 478 PW: ElecraftK3
- 5) Start both KPA500 and KAT500 remote apps, confirm KPA500 is in standby. (Remote tab/start remote hosting)
- 6) KAT500 Remote app check for power on, and on correct antenna. Manual mode.
- 7) Use KAT500 remote app and check SWR with 20 watts (tune button, then K3 tune button)
- 8) Amp to operate, hit K3 tune button again and check for QRO and SWR one last time.
- 9) Bring up N1MM+ Logger
- 10) Operate - monitor amp via KPA500 Remote app.

Shut Down Procedure

- 1) Let amp cool < 40 C, place in standby
- 2) Close N1MM+ Logger
- 3) Close KAT500 Remote app, power stays on
- 4) Shut amp off when temperature is < 40 degrees C, close KPA500 Remote app
- 5) Drop TeamViewer connection
- 6) Shut off K3/0 Mini to break connection
- 7) Back to Slack and let folks know you're off remote



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Addendum A – Changing RRC 1258 MKII operating modes

We support two modes or ways of operating remotely. Mode 4 is for folks using a computer, rig control software, and a logging program. This is a computer based approach and lets folks without their own K3, K3S, or K3/0 Mini enjoy remote operations.

“K3 Twin Mode” serves folks who own a K3/K3S transceiver or K3/0 – Mini terminal unit and use that to connect to the K3 transceiver at Signal Point.

In order to connect successfully the mode in the RRC 1258 MKII box at Signal Point must match your operating mode.

Here’s how to Change modes at Signal Point:

Point your web browser to <http://vjxe2ic0.ddns.remoterig.com:800/> (that’s a zero)

The web page for the far end RCC box will appear.

Select the “Profiles” menu.

From the drop down menu select either “K3 twin Mode” or “Mode 4”

Click on Submit

You’ll be prompted for a log in name and password

Login: Administrator (note capital A)

Password: W0CG (all caps)

Finally click where it says “Here” to apply the new profile and re-boot the box.

If you’re lucky the mode might already be correct for your operating mode.

RRC-1258 MkII: Radio [Curacao Remote Unit]

microbit

- Info
- Status
- Wi-Fi scan
- Profiles
- IP settings
- Radio settings
- Serial settings
- Advanced settings
- Dynamic DNS settings
- Keyer settings
- IO settings
- Ping settings
- Wi-Fi settings
- Export settings(HTML)
- Export settings(bin)
- Import settings(bin)

Profiles

Active profile: 1 - select mode

Profile 1 name:

Profile 2 name:

Profile 3 name:

Profile 4 name:

Profile 5 name:

2 - click on submit

Please verify the settings and then restart the device to apply the profile switch, or click [here](#) to apply/restart now.

↑ 3 - click here to re-boot with the new profile



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Addendum B – Organizing Our Remote Operations

As we add remote operator we need to have a small set of guidelines to make it work for all involved. Here are some “Procedures Lite”.

The control op is your friend and the boss

The way we’re configured right now we need the on-site control op to power up position #4, select the antenna of your dreams, and to kill the web cams that ride on the same Wi-Fi link to minimize latency. Email is probably best way to coordinate this. As a courtesy drop an email to the control op letting him know when you’re done.

Be a Slacker!

I set up a “watering hole” with the Slack app where we can meet in real time while running or pondering remote ops to see what’s going on. It would be a great idea to log in here let folks know what you’re doing. This probably will become our point of coordination. You can also scroll back in time to see what’s transpired.

<https://signalpointremote.slack.com>

Be sure to drop the link when you’re finished so others have access

In “K3 Twin mode” this is automatic when you shut your K3 or K3/0 Mini off. In Mode 4 you need to access your RCC 1258 MKII box’s web page and hit “Disconnect” in the status menu. In an emergency Gene and Jeff know how to access the RCC box at Signal point and force the connect to drop. It would be good for all of us to know this.

There are two distinct modes

We’re able to accommodate both “Mode 4” for end users with just a computer, rig control software, and an RCC box and “K3 Twin Mode” for folks using a K3 transceiver or K3/0 Mini at their home QTH. The RCC box at Signal Point needs the correct configuration profile selected and the box re-booted before you’ll be able to link in.

Amp? Amp!

A KPA500 solid state amp and companion tuner are now online thanks to K8ND’s generosity. We have full rig control and power/SWR/temperature monitoring. Yippee! See pages 23 - 26.

Best Operating Practices

This remote operating regime represents change, and we know some folks break out in hives over change, so be sure to use good operating practices. An example would be making sure to ID in a timely manner.

Need Help?

I’ve set up around 15 remote lash-ups over the past five years so use me as your resource. We’ll develop a deeper pool of expertise going forward – Jeff and Geoff already have a great knowledge base.



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Addendum C – How to hook up the RRC box at the rig (Signal Point)

This a reference for control ops who set position #4 up from deep storage. There also is a diagram on the top of the RRC box that shows the wiring.

Front Panel Connections RRC Box

SP (speaker) to external speaker on the rear of the K3. 3.5mm to 3.5mm cable.

Note - Set front panel K3 audio to no higher than 8 o'clock, otherwise it gives the remote op a thrill when they first connect.

AUX/MIC RJ-12 to the K3 front panel Kenwood type mic connector.

Note - K3 mic select in the top menu is set to front panel, low, no bias. This cable does both PTT and audio in.

Rear Panel Connections RRC Box

13.8 vdc power

Note – when leaving Signal Point the RRC box stays live and is run off a wall wart instead of the Astron power supply. This is so we can access the box and find the IP address for the web cams if need be.

9 pin serial cable from COM2 RRC to RS-232 on the back of the K3.

Note – 38400 bps 8N1 always

CW keying cable from PAD socket (3.5mm) to 1/4" key input on K3.

Note – seats hard, push!

RJ-45 I/O socket to K3 AUX 15 pin "D" socket.

Note – RJ-45 for Ethernet connectivity is right next to this, easy to plug cable into the wrong socket.

Ethernet RJ-45 socket left unconnected, we use Wi-Fi currently.